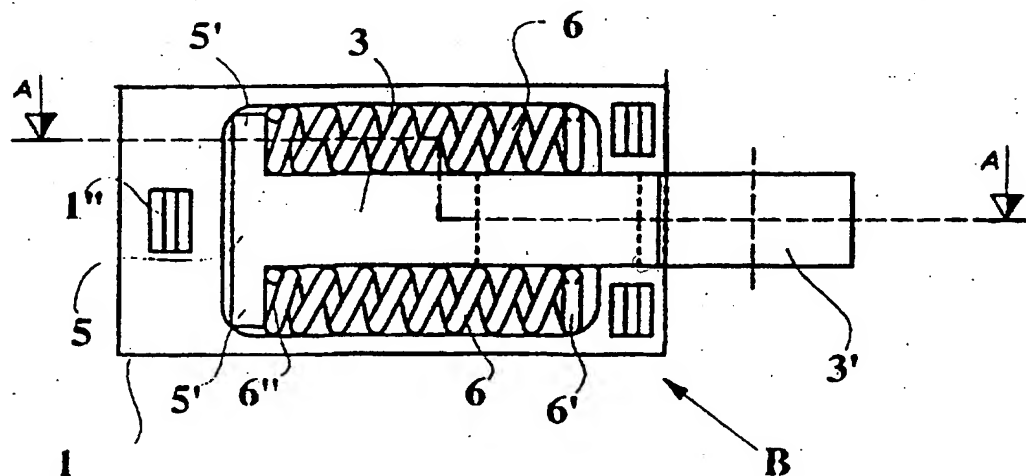


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(54) Title: DEVICE, PARTICULARLY REDUCED, FOR THE ELASTICIZING OF AN EAR-PIECE FOR SPECTACLES



## (57) Abstract

Device, particularly reduced, for the double elasticizing of an ear-piece for spectacles, essentially comprising one small box, combined as finished with the ear-piece by spot-welding and pre-assembled, in whose inside are housed two springs, said springs on one side being with their end in abutment on the bottom of the small box, on the other side being positioned in abutment of the end of a tie-rod, with respect to which are positioned one for each side; and in which the shape of the tie-rod is substantially "T" like having the opposite end, provided with a suitable hole, hingeable to a corresponding small front face provided on the frame of the spectacles.

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DESCRIPTION

DEVICE, PARTICULARLY REDUCED, FOR THE ELASTICIZING OF  
AN EAR-PIECE FOR SPECTACLES

### Technical Field

This invention has for object a device, particularly reduced, for the elasticizing of an ear-piece for spectacles.

The innovation finds particular even if not exclusive application in the field of the spectacles production and of the metal small parts, not excluding their fittings.

## Background Art

It is known that many frames for spectacles are found in prior art. Some of these, provide some devices, made close to the hinging, for allowing the elastic fastening to that part of the frame which is known as front face. Such function, obtained on both sides of the spectacles, on one hand has the advantage of giving a better fitting, because if the ear-pieces, exert a lower pressure on the temples, they are more easily endurable by most people, on the other hand they would result more adaptable to the different anatomical shapes of each subject. The firms of the field therefore, are since a long time thus oriented, with the main purpose of finding innovative and often improving solutions, both with regard to the functioning and mainly to the size, when compared to the pre-existing ones.

For example, a traditional elasticized ear-piece, that found a wide consent among the consumers, consists of the European patent application n.79400087.7, in which was described an elastic hinge for spectacles frame, essentially made up of a box, associated sideways to the ear-piece, for containing a tie-rod means coaxial to said box, and in which the end portion of the tie-rod is threaded, on

1 which is screwed a bushing that ensures the positioning of a spring,  
2 while on the other side it is in abutment on the inside of a seat  
3 obtained in said box.

4 Again a system, conceptually based on the solution provided by the  
5 previous patent, may consist of the utility model n.181221, having  
6 for object an improved hinge for the articulation to a spectacles  
7 frame of an elastically openable ear-piece, in which it is provided a  
8 squared support inserted in the frame, on which it is inserted a  
9 support which is also squared that makes up a shoulder for the  
10 compression of a spring.

11 Finally, the Italian Patent n. 1 147 198, has for object an ear-piece  
12 with elastic hinging, in which the end of the ear-piece involves an  
13 axially holed small block within which is inserted an end for the  
14 connection of the hinge. Continuing with a reduced diameter, it  
15 supports inserted a sharp edge that is fixed inside the borehole while  
16 on the back of this latter is provided a tension helicoidal spring  
17 blocked at the end of the element by a threaded locknut. In such case  
18 it is possible the elastic opening of the ear-piece according to a  
19 certain angle by means of elastic yielding of the hinge-like  
20 connection.

21 The drawbacks noticed, in general common in the mentioned  
22 solutions, consist essentially of the excessive complexity of the  
23 utilized devices, which involved also a total oversizing of the device.  
24 Furthermore, notwithstanding they perform their functions  
25 perfectly, they determine many problems during the execution  
26 phases, on one side for what concerns the realization of the many  
27 precision components, on the other during their assembling, at the  
28 end influencing in considerable measure times and costs. Main

1 purpose of the present firms of the field, has been therefore the  
2 obtainment of the elasticizing devices of the ear-piece, that, even  
3 being more restrained in their size, offer a good functionality  
4 aiming at the same time to reducing the components, facilitating the  
5 assembling and diminishing the costs.

6 In the panorama of the recent devices, in line with the above  
7 mentioned principles, and that are more or less effectively proposed  
8 on the market, there is a solution in which the articulation is all one  
9 with the sliding body for the containing of an elasticizing spring of  
10 the ear-piece. In more detail said body, has a square cross section, in  
11 which longitudinally has been removed some material from one part  
12 to the other, up to obtain opposite thin sheets which define the guide  
13 seat, making up the containing walls of a spring. On one side, the  
14 spring is placed in abutment on said seat, while on the other, it is  
15 fastened to a tooth which protrudes respect to the profile defined by  
16 the sliding body. Of the device considered, is part also a half-hull,  
17 opened on one side to be then associated to an ear-piece, and on the  
18 inside of which is inserted the sliding body complete of the spring,  
19 turning the tooth on the longitudinal surface in which is obtained a  
20 stop reference. Being in a traction condition, the articulation  
21 obliges the body to slide on the inside of the half-hull maintaining  
22 the tooth constantly gripping along the base of said half-hull, up to  
23 compress the spring, therefore recalling elastically the articulation  
24 itself.

25 It is also very common the condition of fastening to said box  
26 preassembled on the end of the ear-piece, the elastic yielding group,  
27 essentially consisting of an articulation on which is screwed a tie-  
28 rod coaxial to a spring, fastened on the opposite side by a suitable

1 bushing.

2 As a consequence, it is possible to notice at least two drawbacks, on  
3 one side, the need for an adequate size, which influences the weight  
4 of the structure, aesthetic not excluded, on the other, the use of  
5 screw means involves considerable assembling times, and therefore  
6 also considerable costs. For some ear-pieces, considered valuable, the  
7 system is still valid, as seen by their wide use, but for the others,  
8 directed to a wider public, the device would not be anymore  
9 convenient, because it should suit costs of the frame definitely more  
10 contained. The continuous research in the field, in recent times, was  
11 therefore directed towards alternative devices, designed for being  
12 promoted in a great amount and mainly able to obviate the use of the  
13 spring passing the box for the fastening of the elastic yielding  
14 group.

15 It is known also the French Patent n. 2 517 080. More in detail is  
16 again described a hinge for spectacles frame, in which the metal  
17 core is all one with the articulation hinged to the front face. More in  
18 detail, the core is placed, passing from one side to the other, coaxial  
19 to a box, which near to one end provides an housing able to contain  
20 an helicoidal compression spring. This latter, on one side is  
21 positioned in abutment on the annular edge obtained through a  
22 working internal to said box, on the other side is being positioned on  
23 the end partially inserted inside the box and which covers the end of  
24 said core. The effect obtained by opening the ear-piece, consists in  
25 visualizing the coaxial sliding of the end with respect to the box  
26 containing the device.

27 The drawbacks of this latter solution consist of the fact that are still  
28 required some complex components, which would make particularly

1 difficult the manufacturing and assembling, not excluded some  
2 manufacturing costs which would affect considerably the finished  
3 product.

4 Always in prior art, are known other improved elastic yielding  
5 devices, which derive more or less from the previously described  
6 solutions, and in which are anyway observable some problems  
7 related to the large size of the articulation.

8 The fact of being particularly bulky, with regard to the elasticizing  
9 device, on one hand is unpleasant to see, on the other it is with no  
10 doubt limiting, because the ear-piece shape conditions its  
11 application. Other negative aspects, commonly noticeable in the  
12 mentioned solutions, regard the fact that it is no possible to combine  
13 the already finished device directly with the ear-piece, thus  
14 involving rather long assembling times. Finally, the traditional ear-  
15 pieces have a tie-rod which, because of its shape, allows an excessive  
16 slack, being inclined to a torsion, not much liked by the consumer.  
17 Purpose of this invention is to obviate the mentioned drawbacks.

18 This and other purposes are reached with the present invention  
19 according to the characteristics to be found in the enclosed claims,  
20 solving the mentioned problems by using a device, particularly  
21 reduced, for the elasticizing of an ear-piece for glasses, essentially  
22 comprising a small box, combined as finished to the ear-piece by  
23 means of spot-welding and preassembled, in whose inside are housed  
24 two springs, said springs on one side being with one end in  
25 abutment on the bottom of the small box, on the other being placed  
26 in abutment of the end of a tie-rod, respect to which they are placed  
27 one for each side; and in which the tie-rod is substantially "T" like  
28 shaped having the opposite end, provided with suitable hole,

1 hingeable to a corresponding small front face provided on the frame  
2 of the spectacles.

3 In such way, through a considerable creative contribution whose  
4 effect represents an immediate technical progress, are obtained  
5 many advantages. First of all it is obtained a substantial reduction of  
6 the size, mainly of the length, that besides being a considerable  
7 aesthetic advantage, allows the widening of the range of the tie-rods  
8 on which said device can be used. A second aspect, non less  
9 important, is the fact that because of the particular "T" like shape of  
10 the tie-rod, are avoided those negative slacks, mainly torsion ones,  
11 very common in the linear single-tie rods, and which for this  
12 reason cause a higher wear of the components. This may cause a  
13 wrong stress of the parts, giving a feeling of precariousness to the  
14 object. For what concerns the productive aspect, some advantages  
15 consist of the fact that the device is completed before being  
16 combined with the ear-piece, and therefore, combined as finished to  
17 this same with a substantial reduction of manufacturing times and  
18 costs.

19 In conclusion, there will be a considerable functionality-price ratio,  
20 making possible the use of the elastic yielding device in a great  
21 amount of spectacles, thus widening the base of the possible  
22 consumers.

23 These and other advantages will appear from the following detailed  
24 description of preferred embodiments with the aid of the enclosed  
25 schematic drawings whose execution details are not to be considered  
26 as limitative but only as examples.

27 Figure 1, represents a total view and seen from the open side of the  
28 small box, of the main part of an elastic yielding device, possible to



1 be combined with a corresponding tie-rod.  
2 Figure 2., represents a longitudinal section view of the device of  
3 Figure 1., seen respectively along the axis A-A.  
4 Figure 3., is a top view of a small front face to be engaged on the  
5 spectacles frame of the device of the previous Figures.  
6 Figure 4., represents a top and a total view of the elastic yielding  
7 device complete with the small front face.  
8 Figure 5. represents always a top and partially section view, of the  
9 device of the previous Figures, seen in use.  
10 Figures 6. and 7., represent respectively a lower and a side view of  
11 the small box, as a part of the elastic yielding device.  
12 Finally, Figures 8. and 9., represent a view taken on the two sides of a  
13 tie-rod provided with a "T" like shaped end.  
14 Referring also to the figures, it can be seen that at least one ear-  
15 piece (A), particularly for spectacles, is elastically yielding for  
16 allowing, when worn, the opening of these same beyond the  
17 common opening axis, generally perpendicular, with respect to the  
18 frame (D). More in detail, each metal ear-piece (A) of the spectacles,  
19 provides as combined on a flat side, and in correspondence of one  
20 end, an elastic yielding device (B), which interacts with a device  
21 part (C), called small front face, and engaged in turn on the  
22 spectacles frame (D). The elastic yielding device (B) consists of a  
23 small box (1), having rather contained size, open (1') on the fixing  
24 side on the corresponding tie-rod (A). Along the perimetrical edge  
25 of the small box (1), always on the open side (1'), are provided three  
26 coplanar teeth of exceeding material (1"), respectively two in the  
27 front part and only one in the back part. Said teeth (1"), during a  
28 following cycle of spot welding by electro-welding, melting with the

1 part of the ear-piece (A) concerned, allow the definite and steady  
2 fastening of the small box (1). A second characteristic, always of the  
3 small box (1), is that of providing a longitudinal opening (2) which  
4 concerns its edge in correspondence of the front part, and which  
5 requires some perpendicular walls (2') respect to a surface with an  
6 oblique base (2''). The purpose of said opening (2), is that of allowing  
7 the axial guide of a tie-rod (3), said tie-rod being in part housed  
8 inside of the small box (1), and in part protruding from this latter  
9 through a flat surface (3') for being hinged to the small front face  
10 (C) of the spectacles (D). The part (3') of the tie-rod (3) provides the  
11 rounded end and a central hole (4) for the hinging to the small front  
12 face (C), while on the opposite side, it is possible to see a progressive  
13 tapering, obtained from an oblique side (3''), which is a positive copy  
14 of the guide's shape (2) obtained in the small box (1). Then always in  
15 the tie-rod (3), it has a straight shape (3''') which joins the hinging  
16 front part (3') with a transversal striker (5). This latter obtained  
17 monolithically from the tie-rod (3), provides the construction of two  
18 wings (5') opposite and perpendicular to the section (3''') defining  
19 two lateral housings, that is allowing the division of the small box  
20 into sections, each of which comprises an helicoidal spring (6). Even  
21 more in detail, the springs (6) concern both sides of the tie-rod (3),  
22 and are placed with one end (6') in abutment on the bottom of the  
23 front part of the small box (1), while with the opposite end (6'') are  
24 in abutment on the corresponding wings (5').  
25 In a possible variation, the end shape of the tie-rod (3), instead of  
26 having a shape similar to a "T", can provide an "L" like shape, (not  
27 shown), practically with only one of the wings protruding  
28 perpendicularly to the same tie-rod. In such case, the housing,

1 obtained on the side of said tie-rod (3), will be allowed for only one  
2 spring (6) rather than for two. Always in a variation relative to this  
3 last hypothesis, the tie-rod (3) can be provided misaligned respect to  
4 a middle position, being longitudinally movable near to an internal  
5 side of the small box (1), which allows to increase the width of the  
6 space which contains the single spring (6).

7 For allowing, in a rest position, to keep the springs (6) slightly  
8 functioning, avoiding any slack mainly relative to the tie-rod (3),  
9 just before the beginning of the oblique side (3") of the tie-rod (3),  
10 is provided a hook (7). The function of this latter, in a static  
11 condition of the device, that is with the springs (6) extended, is the  
12 fact that it stops on the abutment (8) provided, in the manufacturing  
13 of the small box (1), in correspondence of the guide entrance (2).  
14 During the assembling phase, it is therefore possible inserting into  
15 the small box (1), first the tie-rod (3) and then the springs (6), or  
16 also together, which slightly forcing in the respective housings will  
17 result slightly pre-charged.

18 By exerting an axial traction of the tie-rod (3), a condition which is  
19 equivalent to the opening beyond the common opening angle of the  
20 ear-piece (A), is obtained a compression of both springs (6), which  
21 thus contrast its action. As consequence, the ear-piece (A) hinged to  
22 a corresponding front face (C), yields elastically, respect to the front  
23 part of the frame (D), pulling the tie-rod and at the same time  
24 compressing the springs (6), pushed internally against the shoulder  
25 of the front part of the small box (1).

26 Thus, the natural extension of the springs (6), allows to the  
27 spectacles, first to be properly and softly worn by modulating the  
28 pressure exerted by the ear-pieces on the temples, and then, when

1 no more used, the return to a static condition.

1 Claims

2 1. Device, particularly reduced, for the double elasticizing of an ear-  
3 piece for spectacles, characterized in that it comprises essentially a  
4 small box (1), combined with the ear-piece (A) inside of which is  
5 previously housed at least one spring (6), said spring on one side  
6 being with its end in abutment on the bottom of the small box (1), on  
7 the other being placed in abutment of the end (5) of a tie-rod (3),  
8 respect to which it is placed to the side; and in which the shape of  
9 the tie-rod (3) provides at one end (5) at least on section (5')  
10 perpendicular to the connecting stem (3'') of the two ends of the tie-  
11 rod (3), which has the opposite end (3') provided with suitable hole  
12 (4), hingeable to a corresponding small front face (C) provided on  
13 the spectacles frame (D).

14 2. Device, according to claim 1, characterized in that the shape of  
15 one end (5) of the tie-rod (3), in particular the one contained inside  
16 of the small box (1) is similar to the shape of a "T".

17 3. Device, according to claims 1 and 2, characterized in that it  
18 comprises a small box (1), open (1') on the fixing side on the  
19 corresponding ear-piece (A), along whose perimetrical edge, are  
20 provided some points of exceeding material (1''), allowing a  
21 following cycle of spot melting by electro-melting, for the definite  
22 and steady fastening of the small box (1) of the side itself of the ear-  
23 piece (A).

24 4. Device, according to previous claims, characterized in that on the  
25 perimeter of the small box (1), in correspondence of the front face is  
26 provided a longitudinal opening (2) concerning the edge of this  
27 same, provided with perpendicular walls (2') respect to an oblique  
28 base surface (2'').

1 5. Device, according to previous claims, characterized in that the  
2 opening (2), is an axial guide of a tie-rod (3), said tie-rod being  
3 partly housed inside of the small box (1), and partly protruding from  
4 the same through a surface (3') for being hinged to the small front  
5 face (C) of the spectacles (D).

6 6. Device, according to previous claims, characterized in that the tie-  
7 rod (3) having on one side the rounded end (3') and a central hole  
8 (4) for the hinging to the small front face (C), provides on the  
9 opposite side, a progressive tapering given by an oblique side (3''),  
10 which is the positive copy of the shape of the guide (2) obtained  
11 inside the small box (1), and therefore ending with a transversal  
12 striker (5) inside of said small box (1) which defines laterally at least  
13 an housing for an helicoidal spring (6).

14 7. Device, according to previous claims, characterized in that the  
15 part of the tie-rod (3), internal to the small box (1) has a straight  
16 shape (3''') which joins the hinging front part (3'), by an  
17 intermediate oblique section (3''), with a transversal striker (5), this  
18 latter being monolithically obtained, provides, the construction of  
19 two wings (5') opposite and perpendicular to the section (3''')  
20 defining two lateral housings to each of which corresponds an  
21 helicoidal spring (6).

22 8. Device, according to previous claims, characterized in that the  
23 springs (6) concern both sides of the tie-rod (3), and are placed with  
24 one end (6') in abutment on the bottom of the front part of the small  
25 box (1), while with the opposite end (6'') are in abutment of the  
26 corresponding wings (5') of said tie-rod (3).

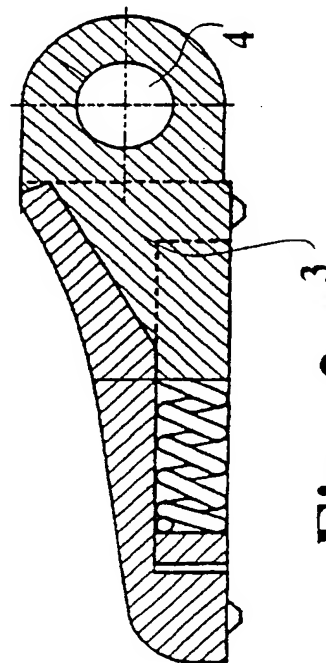
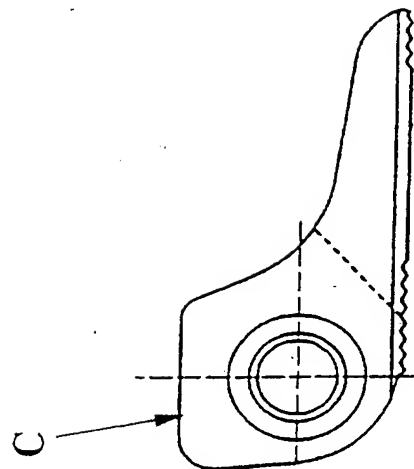
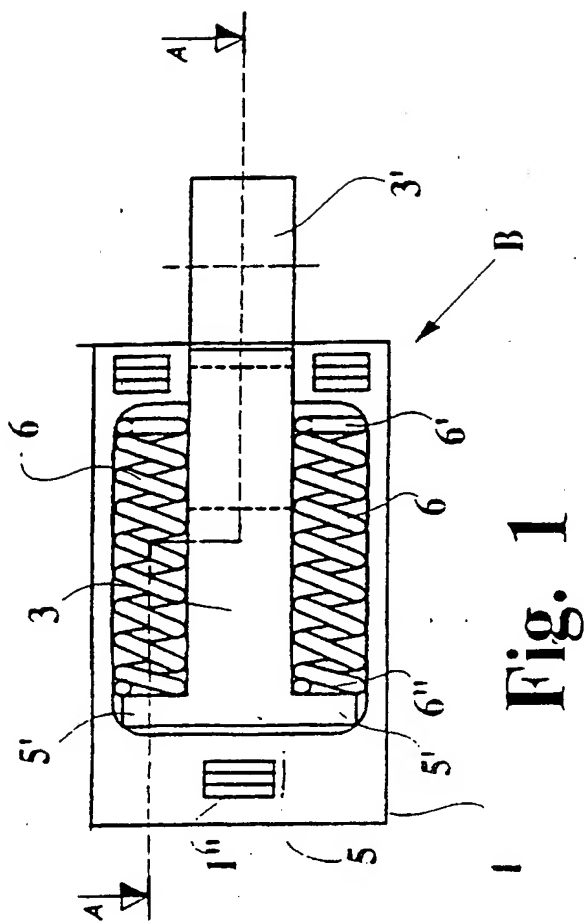
27 9. Device, according to previous claims, characterized in that the  
28 springs (6), are contained in the small box (6) slightly pre-charged,

1 providing in relation to the tie-rod (3), just before the beginning of  
2 the oblique side (3") of the tie-rod (3), a hook (7), which in a static  
3 condition of the device, that is with the extended springs (6), stops  
4 on the abutment (8), provided in the manufacturing of the small box  
5 (1), in correspondence of the guide entrance (2).

6 10. Device, according to previous claims, characterized in that the  
7 end shape (5) of the tie-rod (3), provides an "L" like shape, with only  
8 one of the wings (5') protruding perpendicularly to the same,  
9 obtaining on the side of the said tie-rod (3), only one housing for  
10 one spring (6).

11 11. Device, according to claims 10, characterized in that the tie-rod  
12 (3) is misaligned respect to a middle position, being longitudinally  
13 movable near to an internal side of the small box (1).

1 / 2



sec. A-A



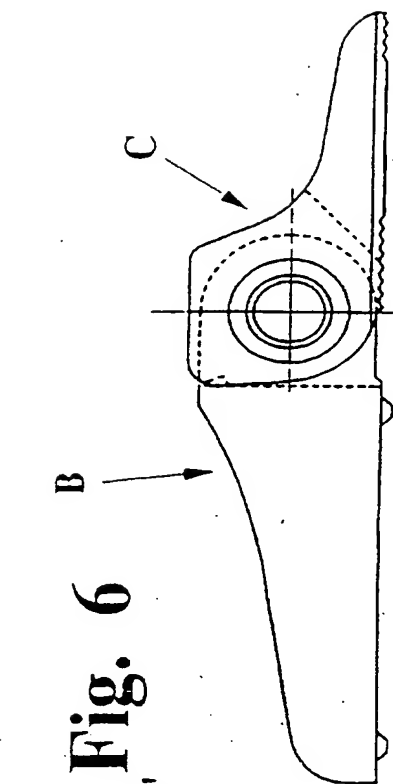


Fig. 6

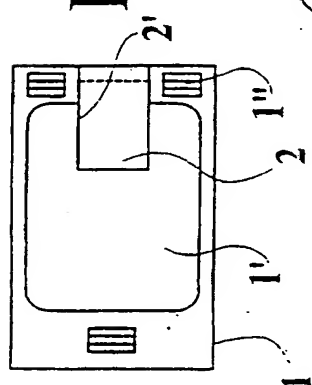


Fig. 8

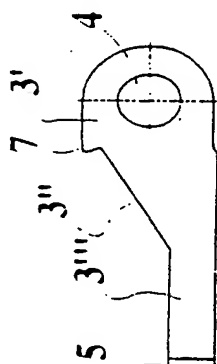
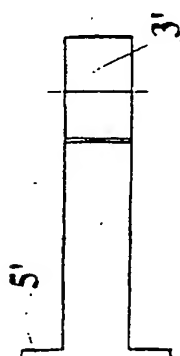


Fig. 9

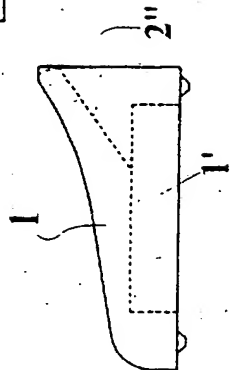


Fig. 4

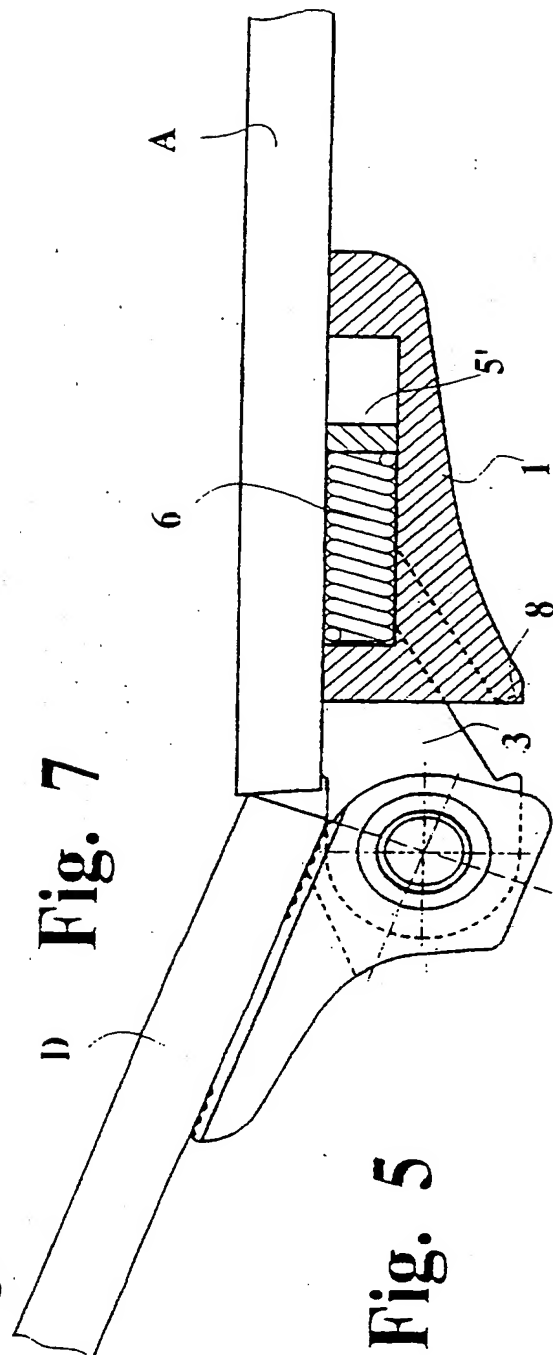


Fig. 7

Fig. 5

# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/IT 97/00088

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G02C5/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G02C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	WO 96 29623 A (IDEAL SRL ; MONTAGNER LUCIANO (IT)) 26 September 1996 see claims	1, 2
A	DE 29 48 113 A (MENRAD FERDINAND FA) 4 June 1981 see page 3 - page 4	1
A	FR 2 097 211 A (R. GIROD) 3 March 1972 see page 1 - page 2, line 4; figures	1
A	EP 0 462 936 A (NATIONALE SA) 27 December 1991 see column 1, line 16 - column 2, line 45	1

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☒ Patent family members are listed in annex.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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